UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OFFICE OF ENVIRONMENTAL CLEANUP
EMERGENCY RESPONSE UNIT

Site Specific Sampling Plan

Project Name: _Avery Landing Site_____ Site ID: _10FT_____

Author: _Mark Woodke/Steve Hall____ Company:_E & E_____. Date Completed: _3/9/12_

This Site Specific Sampling Plan (SSSP) is prepared and used in conjunction with the Quality Assurance Plan (QAP) for the Emergency Response Unit for collecting samples during this Removal Program project. The information contained herein is based on the information available at the time of preparation. As better information becomes available, this SSSP will be adjusted.

When inadequate time is available for preparing the SSSP in advance of the sampling event, a Field Sampling Form may be prepared on-site immediately prior to sampling. This full length version of the SSSP is written after the sampling event and the completed Field Sampling Form attached to it.

1. Approvals

Name, Title	Telephone, Email, Address	Signature
Earl Liverman, **On-Scene Coordinator**	208.664.4858, Liverman.earl@epamail.epa.gov, Coeur d'Alene Field Office 1910 Northwest Boulevard, Suite 208 Coeur d'Alene, Idaho 83814	
Kathy Parker **ERU Quality Assurance Coordinator**	206-553-0062, parker.kathy@epa.gov USEPA , M/S: ECL-116, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	

I. Project Management and Organization

2. Personnel and Roles involved in the project:

Name	Telephone, Email, Company, Address	Project Role	Data Recipient
Earl Liverman	208.664.4858, Liverman.earl@epamail.epa.gov, Coeur d'Alene Field Office 1910 Northwest Boulevard, Suite 208 Coeur d'Alene, Idaho 83814	On Scene Coordinator	Yes
Steve Hall	206 624-9537, sghall@ene.com, Ecology and Environment, Inc. (E & E), 720 Third Avenue, Suite 1700, Seattle, WA 98104	Author of SSSP, START Project Manager	Yes
Kathy Parker	206 553 0062, parker.kathy@epa.gov USEPA , M/S: ECL-116, 1200 Sixth Ave. Suite 900, Seattle, WA 98101	ERU Quality Assurance Coordinator	No
Mark Woodke	206-624-9537, mwoodke@ene.com, E & E 720 Third Ave, Suite 1700 Seattle, WA 98104	START Quality Assurance Reviewer	Yes

TBD	TBD	Laboratory contact	No

3. Physical Description and Site Contact Information:

Site Name	Avery Landing Site	
Site Location	The Site is located approximately 0.75 miles west of Avery, Idaho, on the north side of the St. Joe River in the NW quarter of Section 16, Township 45 North, Range 5 East, Willamette Meridian at Latitude 47° 13' 57'' North and Longitude 115° 43' 40'' West. See Figure 1.	
Property Size	Approximately 6 acres. See Figure 2.	
Site Contact	N/A	Phone Number: N/A
Nearest Residents	The eastern portion of the site includes the Bentcik property, a seasonally occupied residence.	Direction: East
Primary Land Uses Surrounding the Site	North: Highway 50 owned by the Federal Highway Administration (FHA) South: St. Joe River (rural/recreational) East: Rural/recreational West: Rural/recreational	

4. The proposed schedule of project work follows:

Activity	Estimated Start Date	Estimated Completion Date	Comments
SSSP Review/Approval	2/3/2012	3/9/2012	
Mobilize to / Demobilize from Site	5/14/2012	9/28/2012	
Sample Collection	5/15/2012	9/21/2012	
Laboratory Sample Receipt	5/16/2012	9/24/2012	Some samples may require Saturday sample receipt.
Laboratory Analysis	5/17/2012	9/25/2012	Some samples may require expedited results.
Data Validation	5/18/2012	10/14/2012	

5. Historical and Background Information

Describe briefly what you know about the site that is relevant to sampling and analysis for this investigation.

The approximate 6-acre Site is located in the St. Joe River Valley in the Bitterroot Mountains of northern Idaho. It is about 0.75 miles west of the town of Avery, Idaho, with a permanent population between of 50 and 60 residents. The Site is comprised of the following four contiguous properties, as shown on Figure 2: Federal Highway Administration (FHA) property which includes Highway 50/St. Joe River Road; Bentcik property (eastern half of the Site) including a vacation cottage and monitoring wells; Potlatch property (western portion of the Site) which is generally undeveloped with monitoring wells; and the State of Idaho owns the St. Joe River beds and banks along the southern portion of the Site.

The Site was owned and operated by the Chicago, Milwaukee, St. Paul and Pacific Railroad Company (Milwaukee Road) and was developed in the early 1900s as a railroad switching yard, light maintenance facility, and fueling depot. A thick oil, referred to as 'Bunker C' was frequently used in the early 1900s. With the advent of diesel-powered engines in the 1940s and 1950s, Bunker C was replaced with diesel fuel. Until the 1970s the Site was used as a railroad switching and maintenance facility for several railway lines. Activities during this time included refueling locomotives, using solvents to clean engine parts, cleaning locomotives and maintaining equipment. Most of the railroad facilities and structures were demolished after the operations ceased at the Site but contamination resulting from Site activities remains onsite in subsurface soils and groundwater based on field investigations conducted in 2007 and 2009.

6. Conceptual Site Model

Example: Contaminant: Mercury
Transport Mechanism: vapor moving on air currents
Receptors: people living in the house

Contaminants: total petroleum hydrocarbons (TPH) diesel (TPH-Dx) and heavy oil, semivolatile organic compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals (including arsenic, iron, lead, manganese, and mercury) are present in subsurface soil and groundwater at concentrations above action levels. Volatile organic compounds (VOCs) may also be present at the site.

Transport Mechanisms: These contaminants are transported via groundwater migration towards the St. Joe River.

Receptors: The St. Joe River which is adjacent to the site. The river discharges to Coeur d'Alene Lake via Chatcolet Lake in the Heyburn State Park and is part of the Spokane River Drainage Basin. It is a special resource river that is used for wildlife habitat, recreation, and as drinking water for downstream residents. According to the Idaho Administrative Procedures Act (IDAPA) (IDAPA 58.01.02.110.11), the segment of the St. Joe River adjacent to the Site has the following designations: special resource water, domestic water supply, primary contact recreation, cold water communities, and salmonid spawning. Historically, native game fish in the river include westslope cutthroat trout (*Oncorhynchus clarki lewisi)*, bull trout (*Salvelinus confluentus*), and mountain whitefish (*Prosopium williamsoni*). This section of the St. Joe River has been designated as a catch-and-release fishing area for cutthroat trout. Other species of fish found in the river include bull trout, rainbow trout (*O. mykiss*) and Dolly Varden (*S. malma*).

7. Decision Statement

Examples: 1) Determine whether surface contamination exceeds the established action level;
2) Determine appropriate disposal options for contaminated materials.

The decision(s) to be made from this investigation is/are to:

During Excavation Activities

Soil Excavation

1a. Determine if soils in the contaminated area are saturated with oil, have a sheen on groundwater, have oil staining or odor, yield a sheen when performing the petroleum sheen test (PST), or give a result greater than the background reading when headspace testing with a flame ionization detector (FID)/photoionization detector (PID) in the field.

1b. Determine if soil sample TPH-Dx fixed laboratory results in the excavation area correlate with the field screening results during excavation activities. These fixed laboratory analyses will be produced with quick turnaround results.

1c. Determine soil density for fill material.

Surface Water

2. Determine pH, electrical conductivity (EC), turbidity, dissolved oxygen (DO), and temperature of the St. Joe River using field screening during the removal action to determine if the removal action is affecting the surface water.

Air
3. Determine air particulate concentrations during excavation activities using field instruments (DataRams).

Treated Water and Associated Product
4a. Determine treated water results for selected SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, and n-nitrosodiphenylamine), selected target analyte list (TAL) metals (arsenic, cadmium, chromium, copper, lea, thallium, and zinc), and total PCBs from the first few batches obtained during the excavation and from soil stockpile dewatering at a fixed laboratory with quick turnaround time, then periodic batches of treated water will be analyzed for the same parameters with standard turnaround time for the duration of the removal.
4b. Part of the water treatment system involves collection of product using an oil-water separator. The product will be stored separately from the water and will be disposed of after the analyses required by the disposal facility (to be determined), if any, are performed.

Excavated Soil Stockpiles
5. Determine disposal options for the excavated soils removed from the site. Each stockpile will be allowed to dewater until a representative sample from the pile passes the Paint Filter Liquids Test (PFLT; EPA Method 9095). Excavated contaminated soil in stockpiles will be tested as required by the receiving landfill, which is TBD.

After Excavation Activities
Soil Remaining After Excavation
6. Determine final site conditions and determine baseline concentrations for natural attenuation for TPHs, SVOCs, PCBs, and VOCs using a fixed laboratory (TBD) with standard turnaround time.

Groundwater
7. Determine groundwater concentrations of TPHs, SVOCs, PCBs, and VOCs during post-removal groundwater sampling using a fixed laboratory with standard turnaround time.

8. Action Level

State the analyte, concentration, and units for each selected action level. Describe the rationale for choosing each action level and its source (i.e. MTCA, PRG, ATSDR, etc.) Example: The action level for total mercury in soil is 6.7 mg/kg (from Regional Screening Level residential).

Site action levels for the water treatment samples and laboratory reporting limits (TBD) are included in Attachment A.

II. Data Acquisition and Measurement Objectives

9. Site Diagram and Sampling Areas

A Sampling Area is an area within in which a specific action will be performed.
Examples : 1) Each drum on the site is a Sampling Area;
2) Each section of sidewalk in front of the residence is a Sampling Area;
3) Each sampling grid section is a Sampling Area.

Possible sampling areas are included in Figure 2.

Soil Excavation
1a, 1b, and 1c. The contaminated soil and fill material after excavation is completed is a sampling area. Excavation activities will extend to the bottom of the light non-aqueous phase liquid (LNAPL) contaminated soil or to a maximum depth of approximately 2 feet below the seasonal low groundwater level (which is an average depth of 17 feet below ground surface [bgs]). Excavation areas will approximately coincide with the grid layout shown in Figure 3. The primary method for determining field screening excavation extents will be the PST, although a field PID/FID instrument may also be used. Samples will be tested using the PST. The procedure for conducting this test will consist of collecting approximately 50 grams of representative soil at the selected locations within a glass container and applying water to the soil until it is saturated and water collects around the soil. Samples that exhibit a sheen (definite oil film but does not display rainbow) or rainbow sheen (definite oil sheen, film or product that displays rainbow) will be considered contaminated. A passing test will be defined as soil that does not exhibit a sheen or rainbow sheen. If a sheen or rainbow sheen is observed in a sample, additional excavation will be required and re-screening will be performed until a passing test is achieved. Excavation will stop if the soil sample passes the visual screening tests. Samples will be submitted for fixed laboratory analyses for TPH-Dx analysis periodically during the excavation to ensure that the field results agree with the fixed laboratory results. The excavated area will be filled in using 24-inch lifts and will be compacted with equipment suitable for the soil type and will be subjected to field density testing.

Surface Water
2. Surface water in the St. Joe river is a decision area. Surface water monitoring will be conducted upstream and downstream of the removal action area to determine if the removal action is affecting surface water quality in the river.

Air
3. Air in the area of excavation activities is a decision area. Locations upwind and downwind will be monitored for particulate matter with DataRam field instruments to determine if the removal action is creating particulates that exceed applicable regulatory standards.

Treated Water and Associated Product
4a. The water treatment effluent and recovered product is a decision area. Samples will be collected for selected SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, and n-nitrosodiphenylamine), selected target analyte list (TAL) metals (arsenic, cadmium, chromium, copper, lea, thallium, and zinc), and total PCBs from the first few batches with a rush turnaround time, and then periodic batches for the rest of the removal.
4b. The product collected from the oil-water separator is a decision area. If required by the receiving facility, samples will be collected to determine disposal options.

Excavated Soil
5. Excavated soil stockpiles are decision areas. Determine disposal options for the excavated soils removed from the site. Each stockpile will be allowed to dewater until a representative sample from the pile passes the PFLT. Excavated contaminated soil in stockpiles will be tested as required by the receiving landfill, which is TBD.

Soil Remaining After Excavation
6. Soil at the bottom and sides of the excavation area after excavation activities are completed are sampling areas. The samples will be collected to determine final site conditions and determine baseline concentrations for natural attenuation monitoring.

Groundwater
7. Groundwater in and around the perimeter of the site is a decision area. New monitoring wells will be installed at the conclusion of the removal action and TPH, SVOCs, PCBs, and VOCs will be monitored to determine the effectiveness of the removal action.

10. The Decision Rules

These can be written as logical If…, Then.. statements. Describe how the decisions will be made and how to address results falling within the error range of the action level. Examples: 1) In the Old Furnace Sampling Area, the soil in the area around the furnace structure will be excavated until sample analysis with XRF shows no mercury concentrations in surface soil above the lower limit of the error associated with the action level, 18.4 mg/kg. 2) If the concentrations of contaminants in a SA are less than the lower limit of the error associated with the action level, then the area may be characterized as not posing an unacceptable risk to human health or the environment and may be dismissed from additional RP activities. The area may be referred to other Federal, State or Local government agencies.

The following statement(s) describe the decision rules to apply to this investigation:
If the excavated soils indicate the presence of an oil sheen, excavation will continue until the maximum depth of approximately 2 feet below the seasonal low groundwater level is reached.

Soil Excavation
1a and 1b. If the excavated soils do not indicate the presence of an oil sheen, positive PID/FID readings, and/or TPH-Dx contamination, excavation will cease in that area and confirmation samples will be collected.
1c. If the density of the fill material is not within QC limits (approximately 90 percent of maximum relative density), additional compaction will occur until the density is within the limits.

Surface Water
2. If downstream surface water parameters exceed the upstream surface water parameters and the limits in Attachment A, project activities will be modified using Best Management Practices (BMPs) as listed in Appendix A of the Avery Landing Site Removal Action Work Plan and Conceptual Design until the downstream surface water parameters are less than or equal to the upstream parameters and the limits in Attachment A or until no additional project activity modifications are possible.

Air

3. If air monitoring results exceed the QC limits in Attachment A, additional dust suppression activities using BMPs will occur until the air monitoring results are below the QC limits.

Treated Water and Associated Product
4a. If sample results from the water treatment system exceed the limits provided in Attachment A, water will be rerouted through the treatment system again until acceptable results are achieved. If sample results from the water treatment system are below the limits provided in Attachment A, the water will be allowed to discharge to the St. Joe River.
4b. Product obtained from the water treatment system will be skimmed off and stored and disposed separately from the treated water.

Excavated Soil
5. Determine disposal options for the excavated soils removed from the site. Each stockpile will be allowed to dewater until a representative sample from the pile passes the PFLT. Excavated contaminated soil in stockpiles will be tested as required by the receiving landfill, which is TBD.

Soil Remaining After Excavation
6. If excavation activities are completed (either based on the PST or reaching 2 feet below the mean groundwater depth), soil at the bottom and sides of the excavation area will be sampled to determine final site conditions and baseline concentrations for natural attenuation.

Groundwater
7. Groundwater monitoring wells will be sample to determine final site conditions and baseline concentrations for natural attenuation.

11. Information Needed for the Decision Rule

What information needs to be collected to make the decisions – this includes non-sampling info as well: action levels, climate history, direction of water flow, etc. Examples: Current and future on-site and off-site land use; wind direction, humidity and ambient temperature; contaminant concentrations in surface soil.

The following inputs to the decision are necessary to interpret the analytical results:
Cleanup concentrations (see Attachment A)
Contaminant concentrations in subsurface soil, excavated soil, treated water, surface water, ambient air, groundwater, and product.
Future land and downstream surface water use.

12. Sampling and Analysis

For each SA, describe:

1. *sampling pattern (random, targeted, scheme for composite)*
2. *number of samples, how many to be collected from where, and why*
3. *sample type (grab, composite)*
4. *matrix (air, water, soil)*
5. *analytes and analytical methods*
6. *name and locations of off-site laboratories, if applicable.*

1a and 1b. Soil excavation
A sampling grid will be established prior to excavation for the floor and sidewalls; this grid will be used as a guideline for the soil excavation samples but actual sample locations will be determined in the field by the OSC based on site conditions. At a minimum, one confirmation sample will be obtained along a grid with intervals consisting of approximately 150 feet (along plume length) by approximately 100 feet (along plume width), as shown on Figure 3 which will amount to a total of 18 grab samples for the estimated plume extent. For the excavation sidewalls, one soil sample will be collected approximately every 150 horizontal feet of sidewall and approximately every 10 feet of vertical excavation, or part thereof. An estimated one background sample will also be collected outside the estimated plume extent to provide a baseline. Samples shall be a direct grab sample, or, depending on stability of the excavation and access to the selected sample location, may be collected from the bucket of the backhoe performing the excavation. Samples will be collected at a depth of approximately 2 to 6 inches into the exposed surface and containerized as specified by the laboratory with the sample location, date, time and depth documented. Field screening using the PST method (or PID/FID) will be the initial method of determining if the soils have petroleum contamination. Each confirmation soil sample will be analyzed for total petroleum hydrocarbons (Ecology Method NWTPH-Dx) at an approved fixed laboratory.

1c. The excavated area will be filled in using 24-inch lifts and will be compacted with equipment suitable for the soil type. At least one field density test for approximately every three lifts will be taken in accordance

with ASTM Method D1556. Additional field density tests using ASTM Method D2942 (nuclear density gauge) can be also be used. All density testing will be conducted by a neutral third party engineer subcontracted by ERRS. Excavation will be compacted to approximately 90 percent of maximum relative density.

2. Surface Water
An estimated two representative targeted grab surface water samples will be collected and analyzed daily in the field for pH, EC, turbidity, dissolved oxygen (DO), and temperature (using applicable EPA Quick Start Guides and manufacturer's instructions) of the St. Joe River using field screening during the removal action.

3. Air
Daily targeted continuous air monitoring samples will be collected for particulate matter upwind and downwind from the excavation activities using DataRam monitors following the EPA Quick Start Guide and manufacturer's instructions.

Treated Water and Associated Product
4a. Testing and Startup Activities
Startup
The general startup testing of the temporary water treatment system shall consist of treating a minimum of an estimated 50,000 gallons of water collected from the first proposed excavation area. Targeted grab start-up water samples will be collected from the influent, prior to carbon unit 1, prior to carbon unit 2, prior to the clean batch storage tanks, and/or effluent locations and will be analyzed for selected SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, and n-nitrosodiphenylamine) following EPA Method 625, selected target analyte list (TAL) metals (arsenic, cadmium, chromium, copper, lead, thallium, and zinc) following EPA Method 200.8, and total PCBs (EPA Method 608) at an off-site laboratory. The samples shall be collected multiple times during the start-up activities when the system treats approximately 5,000 gallons, 10,000 gallons, and 15,000 gallons for an estimated 25 total samples.
Operational testing
Samples from the treatment facility will be collected on an estimated weekly basis during normal operation of the system to monitor the discharge concentrations. An estimated 100 targeted grab samples will be collected (20 each from the influent, prior to carbon unit 1, prior to carbon unit 2, prior to the clean batch storage tanks, and effluent sampling points) and analyzed for selected SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, bis[2-ethylhexyl]phthalate, chrysene, and n-nitrosodiphenylamine) following EPA Method 625, selected TAL metals (arsenic, cadmium, chromium, copper, lead, thallium, and zinc) following EPA Method 200.8, and total PCBs following EPA Method 608 at an off-site laboratory.
4b. Product Samples
One representative targeted grab product sample will be collected for approximately each 55 gallons of product collected from the treated water system and will be analyzed for the parameters required by the disposal facility (to be determined) at an off-site laboratory (TBD). If required for analysis, an estimated 10 product samples will be collected during the removal action; the actual quantity will be determined based on the volume of product collected

Excavated soil stockpiles
5. One representative random composite soil sample will be collected from each stockpile (up to 2,000 cubic yards). Each stockpile will be allowed to dewater until a representative sample from the pile passes the PFLT. Excavated contaminated soil in stockpiles will be tested as required by the receiving landfill, which is TBD.

Soil Remaining After Excavation
6. An estimated 18 targeted grab soil samples will be collected from the excavation floor and an estimated 36 targeted grab soil samples will be collected from the excavation walls Samples will be collected at a depth of approximately 2 to 6 inches into the exposed surface and containerized as specified by the laboratory with the sample location, date, time and depth documented. Actual sample quantities will be determined in the field based on site conditions. Each confirmation soil sample will be analyzed for the total petroleum hydrocarbons (Ecology Method NWTPH-Dx), heavy oils (Ecology Method NWTPH-Dx), volatile organic compounds (EPA Method 8260), PCBs (EPA Method 8082), and SVOCs (EPA Method 8270) and shall be analyzed by an approved laboratory (TBD).

Groundwater
7. An estimated 4 to 5 monitoring wells will be installed in and around the excavation area after excavation

activities are completed. Targeted grab water samples will be collected quarterly from these monitoring wells and the previously installed upgradient and downgradient monitoring wells for several years after completion of the removal action. The samples will be analyzed for total petroleum hydrocarbons (Ecology Method NWTPH-Dx), heavy oils (Ecology Method NWTPH-Dx), volatile organic compounds (EPA Method 8260), PCBs (EPA Method 8082), and SVOCs (EPA Method 8270) and shall be analyzed by an approved laboratory (TBD).

13. Applicability of Data (place an X in front of the data categories needed, explain with comments)

Do the decisions to be made from the data require that the analytical data be:
1) definitive data, 2) screening data (with definitive confirmation) or 3) screening data (without definitive confirmation)?

*_X_**A) Definitive data** is analytical data of sufficient quality for final decision-making. To produce definitive data on-site or off-site, the field or lab analysis will have passed full Quality Control (QC) requirements (continuing calibration checks, Method Detection Limit (MDL) study, field duplicate samples, field blank, matrix spikes, lab duplicate samples, and other method-specific QC such as surrogates) AND the analyst will have passed a Precision and Recovery (PAR) study AND the instrument will have a valid Performance Evaluation sample on file. This category of data is suitable for: **1) enforcement purposes, 2) determination of extent of contamination, 3) disposal, 4) RP verification or 5) cleanup confirmation.***
Comments: All data provided by off-site laboratories from the treated water, product, excavated soil stockpiles, soils remaining in place after the excavation, surface water, and groundwater will be considered definitive data.

*_X_**B) Screening data with definitive confirmation** is analytical data that may be used **to support preliminary or intermediate decision-making** until confirmed by definitive data. However, even after confirmation, this data is often not as precise as definitive data. To produce this category of data, the analyst will have passed a PAR study to determine analytical error AND 10% of the samples are split and analyzed by a method that produced definitive data with a minimum of three samples above the action level and three samples below it.*
Comments: The PST testing results will be confirmed at a commercial laboratory (TBD) using NWTPH-Dx analyses.

*_X_**C) Screening data** is analytical data which has not been confirmed by definitive data. The QC requirements are limited to an MDL study and continuing calibration checks. This data can be used for making decisions: **1) in emergencies, 2) for health and safety screening, 3) to supplement other analytical data, 4) to determine where to collect samples, 5) for waste profiling, and 6) for preliminary identification of pollutants**. This data is not of sufficient quality for final decision-making.*
Comments: Field water quality parameter, field air monitoring, and soil density testing results will be considered screening data.

14. Special Sampling or Analysis Directions

Describe any special directions for the planned sampling and analysis such as additional quality controls or sample preparation issues. Examples: 1) XRF and Lumex for sediment will be calibrated before each day of use and checked with a second source standard. 2) A field blank will be analyzed with each calibration to confirm the concentration of non-detection. 3) A Method Detection Limit determination will be performed prior to the start of analysis so that the lower quantitation limit can be determined. 4) If particle size is too large for accurate analyses, the samples will be ground prior to analysis. If the sample contains too much moisture for accurate analyses, the sample will be decanted and air dried prior to analysis.

Quick turnaround results will be obtained for soil excavation confirmation samples and initial water treatment system samples.

15. Method Requirements

[Describe the restrictions to be considered in choosing an analytical method due to the need to meet specific regulations, policies, ARARs, and other analytical needs. Examples: 1) Methods must meet USEPA Drinking Water Program requirements. 2) Methods must achieve lower quantitation limits of less than 1/10 the action levels.3) Methods must be performed exactly as written without modification by the analytical laboratory.]

Off-site laboratory methods must achieve detection limits less than or equal to the action levels.

16. Sample Collection Information

[Describe any activities that will be performed related to sample collection]

The applicable sample collection Standard Operating Procedures (SOPs) or methods will be followed and include:

- Field Activity Logbooks SOP
- Sample Packaging and Shipping SOP
- Sampling Equipment Decontamination SOP
- Soil Sampling SOP
- VOC – Soil and Sediment Sampling SOP
- Surface Water Sampling SOP
- Groundwater Well Sampling SOP
- Borehole Installation Methods SOP
- Procedure for Handling Investigation Derived Waste SOP
- Instrument SOPs: Quick Start Guides and/or Manufacturer's Instructions for field instruments (air monitoring and surface water monitoring instruments to be determined)

17. Optimization of Sampling Plan (Maximizing Data Quality While Minimizing Time and Cost)

[Describe what choices were made to reduce cost of sampling while meeting the needed level of data quality. Example: The XRF will be used in situ whenever possible to achieve accurate results. Reproducibility and accuracy of in situ XRF analyses will be checked by collecting, air drying, analyzing and comparing five in situ samples at the start of sampling. Where interferences are suspected, steps will be taken to eliminate the interferences by mechanisms such as drying, grinding or sieving the samples or analyzing them using the Lumex with soil attachment.]

Field screening will be conducted for excavation soils, for surface water parameters, and for ambient air.

The format for sample number identification is summarized in Table 1. Sample collection and analysis information is summarized in Table 2.

Table 1
SAMPLE CODING

Project Name: _Avery Landing Site_____ **Site ID:** _10FT__

SAMPLE NUMBER [(1)]

Digits	Description	Code (Example)
1,2,3,4	Year and Month Code	1205 (YYMM)
5,6,7,8	Consecutive Sample Number (grouped by SA as appropriate)	0001 (First sample of SA)

SAMPLE NAME / LOCATION ID [(2)]
(Optional)

1,2	Sampling Area	BG – Background ES – Excavation soil SS - Soil stockpiles TW - Treated Water SW - Surface Water AA – Ambient Air MW – Monitoring Well RS – Rinsate TB – Trip Blank
3,4	Consecutive Sample Number	01 – First sample of Sampling Area
5,6	Matrix Code	AR – Air GW – Groundwater PR – Product SB – Subsurface Soil SD – Sediment SS – Surface Soil SW – Surface Water QC – Quality Control WT – Water
7,8	Depth (Optional)	01 (feet below ground surface)

Notes:
(1) The Sample Number is a unique, 8-digit number assigned to each sample.
(2) The Sample Name or Location ID is an optional identifier that can be used to further describe each sample or sample location.

Table 2. Sampling and Analysis

Data Quality	Sampling Area	Matrix	Sampling Pattern	Sample Type	Data Quality	Estimated Number of Field Samples	Analyte or Parameter	Method Number	Action Level	Method Quant. Limit	#/type of Sample Containers per Sample	Preservative (Ice for all)	Hold Time (to analysis or to extraction/to analysis)	Field QC
Field Analysis	Soil Excavation	Soil	Targeted	Grab	Screening+ Confirm.	120	Petroleum Sheen Test PID/FID	NA	Presence of Sheen Result above background	NA 1 ppm	1x2 ounce glass for either analysis	NA NA	NA NA	12 Duplicates
Lab Analysis	Soil Excavation	Soil	Targeted	Grab	Definitive	18	Diesel Range TPHs	NWTPH-Dx	NA	25 mg/kg	1x8 ounce glass	Ice	14/40 days	2 Duplicates
Field Analysis	Soil Excavation	Soil	Targeted	Grab	Screening	20	Density	ASTM D1556 and/or D2942	<90% of maximum relative density	1% of maximum relative density	NA/NA	NA	NA	2 Duplicates
Field Analysis	St Joe River	Water	Targeted	Grab	Screening	240	pH Electrical Conductivity Turbidity Dissolved oxygen Temperature	QSG QSG QSG QSG QSG	$\pm$ 10% of upstream	0 Units 0 mS/cm 0 NTU 0 mg/L 0 ^{o}C	NA/NA	NA	NA	24 Duplicates
Field Analysis	Site Perimeter	Air	Targeted	Grab	Screening	240	Particulate Matter	QSG	> 2x upwind	0.0001 mg/m^3	NA/NA	NA	NA	NA
Lab Analysis	Treated Water	Water	Targeted	Grab	Definitive	60 Quick TAT / 65 Standard TAT	Select SVOCs Select Target Analyte List Metals Polychlorinated Biphenyls	EPA 625 EPA 200.8 EPA 608	See Attachment A	5 ug/L 5 ug/L 1 ug/L	2x1 L Amber 1x1 L Poly 2x1 L Amber	NA HNO3 to pH<2 Ice	7/40 days 6 months 7/40 days	12 Duplicates 12 Duplicates 12 Duplicates
Lab Analysis	Product	Product	Targeted	Grab	Definitive	20	TBD by the disposal facility	TBD	TBD	TBD	TBD	NA	NA	1 Duplicate per analysis
Lab Analysis	Soil Stockpiles	Soil	Targeted	Grab	Definitive	20	Paint Filter Liquid Test	EPA 9095	Pass/Fail	NA	1x8-ounce glass jar	NA	NA	2 Duplicates
Lab Analysis	Soil After Excavation	Soil	Targeted	Grab	Definitive	54	Diesel Range TPHs SVOCs VOCs	NWTPH-Dx EPA 8270 EPA	NA NA NA	25 mg/kg 1 mg/kg 1 mg/kg	1-8 ounce glass jar 1-8 ounce glass jar	NA NA NA	14/40 days 14/40 days 48 hours/ 14 days	3 Duplicates 3 Duplicates 3 Duplicates

							Polychlorinated Biphenyls	8260 EPA 8082	NA	1 mg/kg	3xEnCore Samplers 1-8 ounce glass jar	NA	14/40 days	3 Duplicates
Lab Analysis	Groundwater	Water	Targeted	Grab	Definitive	7	Diesel Range TPHs	NWTPH-Dx	NA	250 ug/L	2x32 ounce amber	NA	7/40 days	1 Duplicate
							SVOCs	EPA 8270	NA	10 ug/L	2x32 ounce amber	NA	7/40 days	1 Duplicate
							VOCs	EPA	NA	10 ug/L	2x40 mL VOA	HCl to pH <2	14 days	1 Duplicate
							Polychlorinated Biphenyls	8260 EPA 8082	NA	1 ug/L	2x32 ounce amber	NA	7/40 days	1 Duplicate

Note: For matrix spike and/or duplicate samples, no extra volume is required for air (unless co-located samples are collected), oil, product, or soil samples except soil VOC or NWTPH-Gx samples (triple volume). Triple volume is also required for organic water samples (double volume for inorganic).

Table 3. Common Sample Handling Information

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
Metals	Metals Not including Mercury or Hexachrome. Includes TAL, PP, RCRA lists)	Solid	EPA 6000 / 7000 Series	Glass Jar	200 g	n/a	None	6 months	SW-846 ch. 3
		Aqueous	EPA 6000 / 7000 Series	PTFE or HDPE	600 mL	HNO_3 to pH < 2	Not listed	6 months	SW-846 ch. 3
	Mercury	Solid	EPA 7471B	Glass Jar	200 g	n/a	≤ 6° C	28 days	SW-846 ch. 3
		Aqueous	EPA 7470A	PTFE or HDPE	400 mL	HNO_3 to pH < 2	Not listed	28 days	SW-846 ch. 3
	Hexavalent Chromium, (Hexachrome, Cr+6)	Solid	Lab-specific soil extraction modification, EPA 7196A	Glass Jar	100 g	n/a	≤ 6° C	28 days to extraction	SW-846 ch. 3
		Aqueous	EPA 218.6 (Drinking Water)	PTFE or HDPE	400 mL	n/a	≤ 6° C	24 hours	SW-846 ch. 3
	XRF	Solid (in situ; on the ground surface)	6200	none	n/a	None	none	Analyze Immediately	n/a
		Solid (ex situ)	6200	plastic bag	200 g	None	none	6 months	n/a
VOCs	VOCs / BTEX	Solid	EPA 5035 / 8260B	*	*	*	*	2 days to lab / 14 days	SW-846 ch. 4
		Aqueous	EPA 8260B	Amber Vial with Septa Lid	2 x 40 mL	HCl to pH< 2	≤ 6° C (headspace free)	14 days	SW-846 ch. 4
SVOCs	SVOCs / PAHs	Solid	EPA 8270D	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8270D	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
PCBs and Dioxins/Furans	PCBs	Solid	EPA 8082	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8082	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
	Dioxins/Furans	Solid	EPA 8280 or 8290	Glass Jar	8 ounces	n/a	≤ 6° C	none	SW-846 ch. 4
		Aqueous	EPA 8280 or 8290	Amber Glass	2 x 1 L	n/a	≤ 6° C	none	SW-846 ch. 4
Pesticides and Herbicides	Chlorinated Pesticides	Solid	EPA 8081	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8081	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
	Chlorinated Herbicides	Solid	EPA 8151	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	SW-846 ch. 4
		Aqueous	EPA 8151	Amber Glass	2 x 1 L	n/a	≤ 6° C	7 days	SW-846 ch. 4
NWTPH	Gasoline-Range Organics	Solid	TPHs/NWTPH-Gx	Amber Glass Jar with Septa Lid	4 ounces	n/a	≤ 6° C (headspace free)	14 days	Method
		Aqueous	TPHs/NWTPH-Gx	Amber Vial with Septa Lid	2 x 40 mL	pH < 2 with HCl	≤ 6° C (headspace free)	7 days unpreserved 14 days preserved	Method
	Diesel-Range Organics	Solid	3510, 3540/3550, 8000	Glass Jar	8 ounces	n/a	≤ 6° C	14 days	Method
		Aqueous	3510,	Glass Amber	2 x 1 L	pH < 2 with HCl	≤ 6° C	7 days unpreserved	Method

Analysis Type	Sub Analysis	Matrix	Analytical Method	Container Type	Minimum Volume	Preservative	Temperature/ Storage	Hold Time	Source
			3540/3550, 8000					14 days preserved	
Geotechnical	Particle Size Analysis	Solid	ASTM D-422	Glass Jar or Plastic Bag	2 x 8 ounce	None	n/a	n/a	Method
Miscellaneous	pH	Solid	EPA 9045	Glass Jar	8 ounces	n/a	n/a	Analyze Immediately	SW-846 ch. 3
		Aqueous	EPA 9040	PTFE	25 mL	n/a	n/a	Analyze Immediately	SW-846 ch. 3
	Total Organic Carbon (TOC)	Solid	SW-846 9060	Glass Jar	100 mL	n/a	≤ 6º C	28 days	SW-846
		Aqueous	EPA 415.1	PTFE or HDPE	200 mL	store in dark HCL or H_2SO_4 to pH <2	≤ 6º C	7 days unpreserved 28 days preserved	Method
	Cyanide	Solid	SW-846 9013	Glass Jar	5 g	n/a	≤ 6º C	14 days	SW-846 ch. 3
		Aqueous	SW-846 9010C	PTFE or HDPE	500 mL	NaOH to pH > 12	≤ 6º C	14 days	SW-846 ch. 3
	Conductivity	Aqueous	EPA 120.1	PTFE or HDPE	100 mL	n/a	n/a	Analyze Immediately	Method
	Hardness	Aqueous	EPA 130.1	PTFE or HDPE	1 x 1 L	HNO3 to pH<2	≤ 6º C	28 days	Method
	Total Suspended Solids	Aqueous	EPA 160.2	PTFE or HDPE	100 mL	n/a	≤ 6º C	7 days	Method
	Total Dissolved Solids	Aqueous	EPA 160.1	PTFE or HDPE	100 mL	n/a	≤ 6º C	7 days	Method
	Nitrate/nitrite	Aqueous	EPA 353.2	PTFE or HDPE	1 x 250 mL	H_2SO_4 to pH <2	≤ 6º C	28 days	Method
	Nitrate	Aqueous	SW-846 9210A	PTFE or HDPE	1,000 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Nitrite	Aqueous	SW-846 9216	PTFE or HDPE	25 mL	n/a	≤ 6º C	48 hours	SW-846 ch. 3, Method
	Fluoride	Aqueous	SW-846 9214	PTFE or HDPE	300 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Chloride	Aqueous	SW-846 9250	PTFE or HDPE	50 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Sulfate	Aqueous	SW-846 9035	PTFE or HDPE	50 mL	n/a	≤ 6º C	28 days	SW-846 ch. 3
	Sulfide	Solid	SW-846 9215	Glass Jar	1 x 4 ounces	Fill sample surface with 2N zinc acetate until moistened.	≤ 6º C (headspace free)	7 days	SW-846 ch. 3
		Aqueous	SW-846 9031	PTFE or HDPE	100 mL	4 drops 2N zinc acetate/100 mL sample; NaOH to pH>9.	≤ 6º C (headspace free)	7 days	SW-846 ch. 3

Key:

*	= See individual methods. We typically collect 3xEnCore-type samplers and 1x40 mL VOA vial per sample, keep at ≤ 6ºC with no chemical preservative, and they must be at the lab within 48 hours of collection.				
C	= Celsius	HNO_3	= nitric acid	SVOCs	= semivolatile organic compounds
Cr	= chromium	L	= liter	SW-846	= EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
EPA	= Environmental Protection Agency	mL	= milliliter	TAL	= Target Analyte List
g	=grams	n/a	= not applicable	TPH	= total petroleum hydrocarbons
H2SO4	= sulfuric acid	NaOH	= sodium hydroxide	VOA	= Volatile Organic Analysis
HCL	= hydrochloric acid	PCBs	= polychlorinated biphenyls	VOCs	= Volatile Organic Compounds
HDPE	= high-density polyethylene	PTFE	= polytetrafluoroethylene		
Hg	= mercury	RCRA	= Resource Conservation and Recovery Act		

III. Assessment and Response

A Sample Plan Alteration Form (SPAF) will be used to describe project discrepancies (if any) that occur between planned project activities listed in the final SSSP and actual project work. The completed SPAF will be approved by the OSC and QAC and appended to the original SSSP.

A Field Sampling Form (FSF) may be used to capture the sampling and analysis scheme for emergency responses in the field and then the FSF pages can be inserted into the appropriate areas of the final SSSP.

Corrective actions will be assessed by the sampling team and others involved in the sampling and a corrective action report describing the problem, solution, and recommendations will be forwarded to the OSC and the ERU QAC.

IV. Data Validation and Usability

The sample collection data will be entered into Scribe and Scribe will be used to print lab Chains of Custody. Results of field and lab analyses will be entered into Scribe as they are received and uploaded to Scibe.net when the sampling and analysis has been completed.

18. Data Validation or Verification will be performed by:

ERU's general recommendation on validation is that a minimum of CLP-equivalent stage IIA verification and validation be performed for every SSSP involving laboratory analyses. However, stage IIB is preferred if the lab can provide it. Dioxins should be validated at CLP-equivalent stage 4.

	Data Verification and Validation Stages						
Performed by:	I	IIA	IIB	III	IV	Verification	Other:
E and E QA Reviewer	100% (Field Lab)		100% (Fixed Lab)		10% (Fixed Lab)		
TechLaw QA Reviewer							
EPA Region 10 QA Office							
MEL staff							
Other:							

ATTACHMENT A

Action Levels

Water Treatment System Effluent Discharge Limits

Analytes	Discharge Limit µg/L	Limit Type Based on Monthly Sample	Sample Type
Benzo[a] Anthracene	0.0038	Daily Maximum	Grab
Benzo[a]pyrene	0.0038	Daily Maximum	Grab
Benzo[b]fluoranthene	0.0038	Daily Maximum	Grab
Bis(2-ethyl hexyl)phthalate	1.2	Daily Maximum	Grab
Chrysene	0.0038	Daily Maximum	Grab
n-Nitrosodiphenylamine	3.3	Daily Maximum	Grab
Arsenic	10	Daily Maximum	Grab
Cadmium	0.6	Daily Maximum	Grab
Chromium	11	Daily Maximum	Grab
Copper	11	Daily Maximum	Grab
Lead	2.5	Daily Maximum	Grab
Thallium	0.24	Daily Maximum	Grab
Zinc	120	Daily Maximum	Grab
Total PCBs	0.000064	Daily Maximum	Grab

Other Action Levels

Analytes	Limit	Sample Type
pH	Downstream reading $\pm$ 10% of upstream reading	Grab
Electrical Conductivity	Downstream reading $\pm$ 10% of upstream reading	Grab
Turbidity	Downstream reading $\pm$ 10% of upstream reading	Grab
Dissolved oxygen	Downstream reading $\pm$ 10% of upstream reading	Grab
Temperature	Downstream reading $\pm$ 10% of upstream reading	Grab